COST ACCOUNTS ON SOME NEW YORK FARMS

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A THESIS

Presented to the Faculty of the Graduate School
of Cornell University for the degree of

DOCTOR OF PHILOSOPHY

BY

CARL E. LADD

Reprinted from Bulletin 377, N. Y. State College of Agriculture

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COST ACCOUNTS ON SOME NEW YORK FARMS

C. E. Ladd [1]

INTRODUCTION

Few results of farm cost accounts have been published. The Minnesota Agricultural Experiment Station, in cooperation with the Bureau of Crop Estimates of the United States Department of Agriculture, has published results of complete sets of cost accounts for a number of farms in Minnesota,[2] while several other States have published results of limited studies of the cost of farm products.

In this bulletin results are given from complete sets of cost accounts on New York farms for the years 1912 and 1913. In 1912 accounts were closed on eighteen farms. Fourteen of these were real farms, run in a practical manner, and the results are sufficiently accurate to be used for further study. During that year much experimenting was done with various methods of accounting. In 1913 accounts were obtained from thirty-three farms.

METHODS USED IN INVESTIGATION

SYSTEM OF ACCOUNTING

The system of accounting used was essentially the same as that described in Warren's *Farm Management* and by the writer in another publication.[3] On each farm an inventory was made at the beginning and at the end of the year, care being taken to get the actual farm value of each article inventoried. In the case of animals, the value was placed at what the owner could get for them at a normal sale. Hay, grain, stalks, and other supplies were inventoried at the market price, less the cost of marketing.

Each farmer had two account books, one marked *Work Report* and the other marked *Ledger*. In the work report a record was kept of all the man hours and the horse hours worked on the farm, classified on separate pages under the name of the enterprise for which the work was done. In the ledger an account was kept of all the money paid out or received.

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[1] The writer wishes to acknowledge his appreciation of the carefulness and reliability of the farmers who cooperated in this work. Thanks are due also to Professor G. F. Warren, under whose direction the work was done, for many helpful suggestions and criticisms; to Professor K. C. Livermore, Professor A. L. Thompson, and D. S. Fox, of Cornell University, for many valuable suggestions; and to E. H. Thomson and C. M. Bennett, of the office of Farm Management, United States Department of Agriculture, for assistance and encouragement in collecting the data.

Results of accounts kept by E. B. Brunson and E. V. K. Dwinelle on six farms are included. All the accounts except on these six farms were kept in cooperation with the Office of Farm Management, United States Department of Agriculture.

[2] Cooper, T. B. The cost of Minnesota dairy products. Minnesota Agr. Exp. Sta. Bul. 124.
Hays, W. M., and Parker, E. C. Cost of producing farm products. U. S. Stat. Bur. Bul. 48.
Peck, F. W. The cost of producing Minnesota farm products, 1908–1912. Minnesota Agr. Exp. Sta. Bul. 145.

[3] Ladd, C. E. A system of farm accounting. U. S. Agr. Dept. Farmers' bul. 572:1–15. 1914.

These amounts were entered under separate accounts in the ledger as the transactions occurred. Transfers of feed or other items from one enterprise to another were made in the ledger.

At the end of the year the total number of man hours worked on the farm was found from the work report. The total cost of labor was found from the ledger. To find the labor cost per hour, the total cost was divided by the total hours worked. All labor was then charged at this rate to the various enterprises, according to the number of hours worked on each. The cost of horse labor was found and distributed in the same way. The cost of equipment use for the year was distributed among the various enterprises on the basis of the number of horse hours worked on each enterprise.

Where manure was used, ordinarily 40 per cent of the value of the manure and 40 per cent of the cost of applying it was charged to the crop receiving the application; 30 per cent of each value was charged to the next crop on the same field; 20 per cent to the third crop; and 10 per cent to the fourth. These percentages were varied somewhat according to the physical characteristics of the soil.

Further details of the system used may be found in either of the two references already cited.

METHOD OF COOPERATING

The work was undertaken, not as an extension, but as an investigative, enterprise. In most cases farmers were not asked to cooperate. After the first year so many farmers applied for the opportunity that the question became one of selecting those who seemed most likely to keep accurate records.

The College furnished all account books, and the college representative visited the farms to inspect the accounts, aided in taking inventories, and closed the accounts at the end of the year. Factors were worked on all the accounts at the end of the year, and these, together with a letter of explanation and criticism of results, were sent to the farmer. In return for these services, the College received a copy of each cooperator's books, with the understanding, however, that in using individual results the cooperator's name should not be given. The cooperators as a whole have done their part of the work faithfully, and each year a large proportion have kept on with the work for the following years.

FARMS STUDIED

TYPES OF FARMING

Several types of farming are represented in the study. In 1913, out of thirty-one farms twenty-two had herds of five or more cows. Five of these herds consisted of purebred stock, and seventeen were grade herds or largely grades with a few purebreds. Many of these dairymen had cash crops to sell, some of these crops being potatoes, cabbage, beans, hay, wheat, buckwheat, apples, hops, tobacco, and peas. The remaining nine farmers kept only enough cows for home use, or perhaps sold a small surplus of milk or butter to neighbors. One of the nine farmers in this class fed steers, one fed sheep and steers, and one fed dry stock through the winter, in order to obtain manure and to make use of straw, bean pods, cornstalks, or poor hay. These nine farmers were selling such crops as potatoes, cabbage, beans, hay, wheat, apples, grapes, and small fruits.

Several of the farms that are located near large cities raised truck crops to a considerable extent.

AVERAGE SIZE OF FARMS COOPERATING

The average farm of New York State, according to the United States Census of 1910, comprises 102.2 acres, of which 68.8 acres are improved. The farms for which accounts were kept in 1913 average 203.6 acres and 111.5 crop acres. The fact that these farms are about twice as large as the average should be kept in mind in interpreting the results of the study.

RESULTS

MAN LABOR

The usual wages paid for farm help in 1912 and 1913 ranged from $1.25 to $2 a day for help given one or two meals; from $25 to $32 a month, with board; from $30 to $40 a month, without board. Higher wages were usually paid for short periods of time in the summer, and lower wages for the winter months. The cost of man labor on the farms studied is given in table 1:

TABLE 1. COST OF MAN LABOR, INCLUDING BOARD, HOUSE RENT, AND ALL OTHER EXPENSE

Year	Number of farms	Average cost of man labor per farm	Average number of man hours per farm	Average cost per man hour
1912	13	$1,416.33	9,009	$0.1572
1913	31	1,561.80	9,158	0.1705

Nine farms had a labor cost of more than $2,000, while eleven had a labor cost of less than $1000. One farm worked 21,743 man hours and had an average of about seven men; one farm worked 3695 man hours and had an average of about one and one-half men. Four farms had a labor cost of less than 12 cents an hour, seven had a labor cost of more than 20 cents an hour, and twenty-three had a labor cost between 15 and 20 cents an hour.

The average distribution of labor costs is shown in table 2:

TABLE 2. AVERAGE DISTRIBUTION OF LABOR COSTS

	1912		1913	
	Average cost per farm	Per cent of total	Average cost per farm	Per cent of total
Cash paid	$517.30	36	$587.11	38
Board furnished	224.68	16	159.37	10
House rent and miscellaneous supplies	38.83	3	66.83	4
Unpaid family labor	102.98	7	174.49	11
Operator's labor	532.54	38	574.00	37
Total	$1,416.33		$1,561.80	

The amount paid in cash was about equal to the value of the operator's labor. Twenty farms used some family labor other than the operator's. Thirty-seven farms furnished board, and eleven farms furnished tenant houses, to labor.

HORSE LABOR

In finding the cost of horse labor, the cost of keeping work horses was not separated from the cost of keeping boarded horses and the cost of raising colts. All horses were reduced to a horse unit basis, two colts or one horse being counted as equal to one horse unit.

In 1912, on fourteen farms, there were 73.8 horse units, made up of 72 work horses and 3.5 colts. In 1913, on thirty-one farms, there were 189.8 horse units, made up of 173.5 work horses, 4 boarded horses, and 24.6 colts. Colts were raised in 1912 on four farms, and in 1913 on fifteen farms. The averages that concern horse labor are given in table 3:

TABLE 3. AVERAGE VALUE PER HORSE UNIT, AND OTHER FACTORS

Year	Average value per horse unit	Average size of farm (acres)	Average number of crop acres		Average number of cattle units		Average number of work horses per farm	Average number of horse units per farm
			Per farm	Per work horse	Per farm	Per work horse		
1912	$175.34	220.9	103.9	20.20	19.0	3.70	5.14	5.27
1913	156.49	203.6	111.5	19.92	21.8	3.89	5.60	6.12

The average value per horse unit on different farms varied from $74.10 to $267.56. The cheapest horses were on a small, gravelly farm, where small, light animals were used; the highest-priced horses were on a large farm with a very heavy clay soil. One farm had an average of 11.5 work horses for the year, while the smallest number was 2. The number of crop acres per work horse varied with the size of farm and the crops raised. One farm of 172 acres had 41.3 crop acres per work horse. On this farm there were 22 acres of hay, 7 acres of oats and wheat, and 12 acres of potatoes, for each work horse. One farm of 53 acres had 11 crop acres per work horse. The average figure for crop acres per work horse checks closely with the results for farms of the same size in Livingston and Jefferson Counties.[4]

The cost of keeping a horse unit for one year is apportioned as shown in table 4:

TABLE 4. DISTRIBUTION OF COST OF KEEPING A HORSE UNIT FOR ONE YEAR
(73.8 horse units in 1912, 189.8 horse units in 1913)

	1912		1913	
	Average cost per horse unit	Per cent of total cost	Average cost per horse unit	Per cent of total cost
Forage and bedding	$42.96	27	$40.90	28
Grain	57.72	36	46.39	32
Shoeing	4.24	3	4.87	3
Veterinary and medicine	2.00	1	0.69	1
Man labor	23.55	15	22.97	16
Equipment labor	0.82	1	0.67	1
Use of buildings	5.75	3	5.92	4
Interest	8.77	5	7.82	5
Miscellaneous	0.38	....	2.63	2
Depreciation	*14.03	9	†12.10	8
Total cost	$160.22		$144.96	
Manure	$12.34		$12.63	
Miscellaneous receipts	0.28		3.33	
Total manure and miscellaneous	$12.62		$15.96	
Net cost	$147.60		$129.00	

* Appreciation on four farms.
† Appreciation on eight farms.

The average cost of keeping a horse unit for one year, after deducting value of manure and miscellaneous receipts, was $147.60 in 1912 and

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[4] Warren, G. F. Some important factors for success in general farming and in dairy farming. Cornell Univ. Agr. Exp. Sta. Bul. 349 : 670.

$129 in 1913. The total cost of forage, bedding, and grain per horse unit was $100.68 in 1912 and $87.29 in 1913. All grain and forage was cheaper in 1913 than in 1912. Seven farms had a forage and bedding cost per horse unit below $30, while for eight farms this cost was above $55. Of the seven farms with a low cost, five were in regions where there was a shortage in forage and bedding that year.

Four farms had a grain cost of less than $30 per horse unit, and eleven farms had a grain cost of over $60 per horse unit. None of the farms with a low forage and bedding cost had a low grain cost. On two of the farms with a low grain cost alfalfa hay was used for feed; on one the horses were worked an average of only 1.8 hours a day; and on the fourth the horses were kept in very poor condition. Four of the farms with a high grain cost had a low forage and bedding cost, and seemed to replace forage with grain.

Six farms had a man labor cost per horse unit of more than $35. None of these had winter dairies or much winter work, and so probably spent more chore time on horses than was necessary. Four of these farms kept horses in a building separate from the other stock, and labor was inefficiently used in doing chores. Eleven farms had a man labor cost per horse unit of less than $15. All of these had barns very efficiently arranged for doing chores.

The relation of the amount of business done to the cost of horse labor is shown in table 5:

TABLE 5. RELATION OF SIZE OF BUSINESS TO COST PER HOUR OF HORSE LABOR, 1913

Size of business measured in total horse hours	Number of farms	Average number of horse hours	Cost per horse hour
Less than 3,000	8	2,421	$0.1788
3,001–5,000	9	3,954	0.1730
5,001–7,000	7	6,200	0.1465
Over 7,000	7	9,442	0.1287

Records for eight farms are given in both the 1912 and 1913 tabulations. Horses on these farms were fed more when feed was cheaper. The comparative quantities of feed for the two years are shown in table 6:

TABLE 6. AVERAGE QUANTITIES OF FEED PER HORSE UNIT PER YEAR ON EIGHT FARMS IN 1912 AND ON THE SAME FARMS IN 1913

	1912	1913
Pounds of grain	3,846	4,434
Pounds of forage and bedding	7,099	7,960

EQUIPMENT

Important special machinery — such as cream separators, incubators, and gasoline engines, which are not used with horses — was inventoried under the enterprises for which it was used. All other machinery, including harnesses and small tools, was inventoried under *Equipment*. The costs for this equipment are given in table 7:

TABLE 7. EQUIPMENT COSTS

Year	Number of farms	Investment in equipment per farm	Investment per crop acre	Annual cost	Per cent of average investment in annual cost	Cost per crop acre	Cost per horse hour
1912....	13	$981.46	$9.80	$249.62	25.4	$2.49	$0.0503
1913....	31	922.93	8.28	271.56	29.4	2.44	0.0513

One farm owned equipment worth $341, and one owned equipment worth $1902.50. The annual cost of equipment per crop acre was $2.49 in 1912 and $2.44 in 1913. The use of equipment was charged on the basis of the horse hours used on each enterprise. The use of equipment cost 5.03 cents per horse hour in 1912 and 5.13 cents in 1913.

The average distribution of the annual cost of equipment is shown in table 8:

TABLE 8. AVERAGE DISTRIBUTION OF ANNUAL COST OF EQUIPMENT

	1912		1913	
	Average cost per farm	Per cent of total cost	Average cost per farm	Per cent of total cost
Depreciation................	$99.01	39	$124.43	45
Cash repairs................	39.66	16	38.86	14
Oil.........................	1.08	1	1.53	1
Use of buildings............	29.38	12	34.86	13
Interest....................	49.07	19	46.07	17
Man labor...................	19.75	8	18.86	7
Horse labor.................	5.94	2	3.64	1
Miscellaneous...............	8.40	3	7.20	2
Total cost..............	$252.29		$275.45	
Miscellaneous receipts.......	$2.67		$3.89	
Net cost....................	$249.62		$271.56	

The average annual depreciation on equipment was 10.1 per cent of the average inventory in 1912, and 13.5 per cent of the average inventory in 1913. The inventory value of equipment is of course much less than the cost when new.

CROPS

TIMOTHY AND CLOVER HAY

In its climate, soils, and markets, New York State is well adapted for hay production. Nearly all the farms in the State raise hay. Of the total area in crops on cooperating farms, 38 per cent in 1912, and 34 per cent in 1913, was in timothy and clover. This percentage varied from 9 to 62 on individual farms. Only one farm with which accounts have been kept did not raise timothy and clover; this farm raised alfalfa. On several farms the hay account included small fields of alfalfa or oat and pea hay. These farms were not included in the tabulation. The average yield of timothy and clover hay for New York State was 1.25 tons per acre in 1912, and 1.14 tons per acre in 1913.[5] The average yield on the cooperating farms was slightly higher than the average for the State. One farm had an average yield of 2.5 tons per acre, while on one farm the yield was only 0.66 ton per acre. Both these farms, however, made a profit in producing hay.

The data concerning the production of timothy and clover hay are given in table 9. Very little of this hay was marketed during the year.

TABLE 9. AVERAGES FOR TIMOTHY AND CLOVER HAY

	1912	1913
Number of farms	12	23
Total number of acres	487.5	823.7
Total yield in tons	679.5	1185.9
Yield per acre in tons	1.39	1.44
Value per acre	$15.53	$16.34
Cost per acre	12.58	12.31
Profit per acre	2.95	4.03
Value per ton	$11.15	$11.35
Cost per ton	9.03	8.55
Profit per ton	2.12	2.80
Profit per man hour	$0.27	$0.37
Man hours per acre	11.03	10.80
Horse hours per acre	10.50	10.25
Cost per acre aside from marketing	....	$12.11
Cost per ton aside from marketing	....	8.41
Man hours per acre aside from marketing	....	10.17
Horse hours per acre aside from marketing	....	9.74

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[5] U. S. Agr. Dept. Yearbook 1913: 418.

The value per ton used in the computation is in most cases farm value, and includes each year some hay of poor quality inventoried at $8.50 or $9 a ton.

Only five farms showed a loss on the hay account. One farm with a yield of 1.8 tons per acre made a profit of $8.75 per ton. Fourteen farms made a profit per man hour of 50 cents or more.

The number of man hours per acre varied from 5.76, on a farm that harvested 100 acres with an average yield of only 1 ton per acre, up to 21.5, on a farm with a yield of 1½ tons per acre. The latter farm was also very rough and hilly, and its hay was distributed in several small, rough, irregular fields. The number of horse hours on these two farms were 7.52 and 14.53, respectively.

In 1913, of 1185.9 tons of hay raised, 78.7 tons were marketed during the year. Some was held for sale later. The cost of production was separated from the cost of marketing. The use of buildings was charged as a cost of production. All time and charges beginning with the pressing of the hay or the removal of the hay from the mow, and including delivery to car or market, were charged to cost of marketing.

Most of the hay was sold on the understanding that the buyer should pay for the pressing. All marketing costs were figured on this basis and do not include the cost of pressing. In most cases the farmer furnished the men to pitch the hay to the press. The cost of marketing this hay is shown in table 10:

TABLE 10. COST OF MARKETING 78.74 TONS OF HAY, 1913

Man hours per ton	6.54
Horse hours per ton	5.21
Average haul in miles	3.00
Man labor cost per ton	$1.14
Horse labor cost per ton	0.72
Equipment cost per ton	0.23
Total cost per ton	$2.09

The average distribution of the cost of producing hay in 1912 and in 1913 is shown in table 11.

The hay crop has a smaller proportion of its total cost in labor than has any other crop grown on these farms. Labor (man, horse, and equipment) amounted to over thirty per cent of the total cost. Use of land, and manure and fertilizer, were the next most important costs.

TABLE 11. AVERAGES FOR HAY

	1912		1913	
	Average cost per acre	Per cent of total cost	Average cost per acre	Per cent of total cost
Seed	$0.98	8	$1.07	9
Fertilizer and manure	3.03	24	2.78	22
Man labor	1.67	13	1.80	15
Horse labor	1.70	13	1.47	12
Equipment labor	0.58	5	0.51	4
Use of land	3.61	29	3.67	30
Use of buildings	1.00	8	1.00	8
Miscellaneous	0.01	....	0.01	....
Total cost	$12.58		$12.31	

OATS

Oats are the most widely grown grain in New York State. In 1912 and 1913 all except one of the cooperating farms raised oats.

There are several reasons why many New York farmers raise oats even though the account may show a loss. On many farms oats are grown as a nurse crop with which to seed timothy and clover. Oats are also used very extensively as horse feed. The work on this crop comes at a time of the year when few other crops compete with it for labor. Oat straw is the chief bedding on many farms.

The data concerning the production of oats are given in table 12:

TABLE 12. AVERAGES FOR OATS

	1912	1913
Number of farms	10	27
Total number of acres	107.0	474.3
Total yield of grain in bushels	4,723.0	16,661.5
Yield of grain per acre in bushels	44.14	35.13
Value per acre	$20.62	$19.40
Cost per acre	23.51	22.34
Loss per acre	2.89	2.94
Value per bushel of grain *	$0.39	$0.45
Cost per bushel of grain*	0.46	0.53
Loss per bushel of grain	0.07	0.08
Loss per man hour	$.12	$.13
Man hours per acre	23.85	21.91
Horse hours per acre	33.12	30.80
Pounds of commercial fertilizer per acre	....	†201

* Without straw.

† Average for the 19 farms on which commercial fertilizer was used.

The average yield of oats in New York State was 30.8 bushels in 1912 and 33.5 bushels in 1913.[6] The average yield on the farms studied was higher in 1912 than in 1913. The farms studied in 1912 were located more generally in the grain-producing sections of the State. The average yield for 1913 is close to the average for the State for that year, and all the cost factors are probably more typical of the State as a whole than are the factors for 1912.

Eight farms raised oats at a cost of less than $20 an acre, and on one farm the cost was as low as $13.30 an acre. This farm raised oats after potatoes, without plowing the land for the oats; in this way a large part of the labor cost was saved.

Seven farms made a profit in producing oats. One farm raised 73.6 bushels per acre at a cost of $19.20. This farm made a profit of $14.09 per acre, or 58 cents per man hour, on its oats.

The average distribution of the cost of raising oats is shown in table 13:

TABLE 13. Average Distribution of Cost of Producing Oats

	1912		1913	
	Average cost per acre	Per cent of total cost	Average cost per acre	Per cent of total cost
Seed	$2.04	9	$1.20	5
Fertilizer and manure	3.90	17	5.57	25
Man labor	3.83	16	3.60	16
Horse labor	5.72	24	4.59	21
Equipment labor	1.58	7	1.59	7
Use of land	3.70	16	3.83	17
Use of buildings	1.24	5	0.69	3
Threshing	1.12	5	0.90	4
Twine	0.30	1	0.20	1
Miscellaneous	0.08	....	0.17	1
Total cost	$23.51		$22.34	

Labor cost (man, horse, and equipment) represents from 45 to 50 per cent of the total cost of growing oats. Use of land constitutes only from 16 to 17 per cent of the total cost. The fertilizer and manure charge against oats is rather large. Most of the manure, however, is not applied directly to the oats, but is the estimated residual value from manure on the previous crop, which is generally a cultivated crop and ordinarily receives a large quantity of manure.

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[6] U. S. Agr. Dept. Yearbook 1913: 391.

SILAGE CORN

Many dairy farmers in New York State have ceased to raise corn for grain, and now raise this crop for silage only. This is a relatively new enterprise for most farmers, and the yields, costs, and values for silage corn are less known than are those for the older crops.

In order to obtain the total yield of silage corn on each farm, the silos were measured and their capacity was computed on the basis of tables given in King's *Physics of Agriculture*. The value per ton was estimated as about one-third that of timothy hay. This value was varied somewhat with the quality of the silage, the amount of grain contained, and other factors.

The data concerning the production of silage corn are given in table 14:

TABLE 14. AVERAGES FOR SILAGE CORN

	1912	1913
Number of farms	7	21
Total number of acres	101.0	262.8
Total yield in tons	809.0	1,659.5
Yield per acre in tons	8.01	6.31
Value per acre	$33.00	$26.04
Cost per acre	31.27	32.59
Profit or loss per acre	1.73	− 6.55
Value per ton	$4.12	$4.12
Cost per ton	3.90	5.16
Profit or loss per ton	0.22	— 1.04
Profit or loss per man hour	$0.05	—$0.16
Man hours per acre	37.4	41.8
Horse hours per acre	52.9	59.4
Pounds of commercial fertilizer per acre	......	*325

* Average for the 14 farms that used commercial fertilizer on corn.

Weather conditions in 1912 were favorable for the production of corn, and the yield was 8.01 tons per acre. On September 8, 1913, there was a hard freeze throughout most of New York State. Few fields of corn had been cut at that time and the crop was heavily damaged. This accounts for the low yield of 6.31 tons per acre for 1913.

The best yield of silage corn for the two years was 11 tons per acre. One farm had a yield as low as 3.29 tons per acre. Four farms in 1912 and five in 1913 produced silage corn for less than $4.12 a ton.

The average distribution of the cost of raising silage corn is shown in table 15.

TABLE 15. Average Distribution of Cost of Producing Silage Corn

	1912		1913	
	Average cost per acre	Per cent of total cost	Average cost per acre	Per cent of total cost
Seed	$0.70	2	$0.89	3
Fertilizer and manure	5.88	19	6.41	20
Man labor	5.85	19	6.86	21
Horse labor	8.85	28	8.67	27
Equipment labor	2.66	9	3.04	9
Use of land	3.18	10	3.39	10
Use of buildings	1.68	5	1.52	5
Filling machinery	2.08	7	1.43	4
Miscellaneous	0.39	1	0.38	1
Total cost	$31.27		$32.59	

The labor cost of raising silage corn is about 56 per cent of the total cost. The next most important costs are for fertilizer and manure, which amount to about 20 per cent of the total, and use of land, which is 10 per cent of the total. The cost for use of buildings was estimated high enough to cover interest and annual depreciation on the silo. This charge is higher than the charge for buildings of the same value used by other crops, for the annual depreciation on silos is higher than on barns. The cost of twine for binding the silage corn is included under *Miscellaneous*.

TABLE 16. Average Cost of Producing Silage Corn up to the Time of Harvesting

	1912	1913
	Cost per acre	Cost per acre
Seed	$0.70	$0.89
Fertilizer and manure	5.88	6.41
Man labor	3.72	4.08
Horse labor	6.06	6.27
Equipment labor	1.78	1.88
Use of land	3.18	3.39
Total cost	$21.32	$22.92
Man hours	23.11	25.01
Horse hours	36.06	43.32

The cost of raising the corn, and the cost of harvesting and putting the corn in the silo, were separated. The point of separation was after the last cultivation. All work and expense before this was considered a part of the cost of production. The labor of harvesting the corn and filling the silo, the use of the silo-filling machinery, the twine, and the use of the silo, were considered in the cost of harvesting. The distribution of the cost up to the time of harvesting is shown in table 16, and of harvesting in table 17:

TABLE 17. AVERAGE COST OF HARVESTING SILAGE CORN AND OF FILLING SILO, INCLUDING USE OF SILO

	1912		1913	
	Cost per acre	Cost per ton	Cost per acre	Cost per ton
Man labor	$2.13	$0.26	$2.78	$0.44
Horse labor	2.79	0.35	2.40	0.38
Equipment labor	0.88	0.11	1.16	0.18
Filling machinery	2.08	0.26	1.43	0.23
Miscellaneous	0.39	0.05	0.38	0.06
Use of silo	1.68	0.21	1.52	0.24
Total cost	$9.95	$1.24	$9.67	$1.53
Man hours	14.33	1.79	16.8	2.66
Horse hours	16.88	2.11	16.11	2.55

Over one-third of the total labor on silage corn is spent in harvesting the corn and filling the silo.

In Farmers' Bulletin 578 of the United States Department of Agriculture, the cost of filling the silo is placed at 87 cents a ton. This figure, however, does not include use of ordinary equipment, use of silo, or use of silo-filling machinery. If the figures given in table 17 for these items are added to the 87 cents a ton, the result checks very closely with the total cost per ton as given in the table.

POTATOES

In 1912 and 1913 potatoes were raised on every cooperating farm. Many of the farmers, however, raised potatoes only on small acreages, for home use. Only fields of two acres or more were used in the tabulation.

The average yield of potatoes for the farms studied was 102.49 bushels in 1912 and 102.66 bushels in 1913. The average yield for the State was 106 bushels in 1912 and 74 bushels in 1913.[7] The highest yield obtained in the two years on the farms studied was 230 bushels an acre, while on three farms the yield was less than 50 bushels an acre.

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[7] U. S. Agr. Dept. Yearbook **1913**: 412.

The data concerning the production of potatoes are given in table 18:

TABLE 18. AVERAGES FOR POTATOES

	1912	1913
Number of farms	8	18
Total number of acres	57.5	185.4
Total yield in bushels	5,893.0	19,032.8
Yield per acre	102.49	102.66
Value per acre	$55.28	$64.09
Cost per acre	64.88	56.71
Profit or loss per acre	— 9.60	7.38
Value per bushel	$0.54	$0.62
Cost per bushel	0.63	0.55
Profit or loss per bushel	— 0.09	0.07
Profit or loss per man hour	—$0.09	$0.08
Man hours per acre	101.53	88.11
Horse hours per acre	102.26	84.50
Cost per acre aside from marketing	....	$53.74
Cost per bushel aside from marketing	....	0.52
Man hours per acre aside from marketing	....	77.68
Horse hours per acre aside from marketing	....	77.35
Pounds of commercial fertilizer per acre	....	*522

* Average for the 12 farms that used commercial fertilizer on potatoes.

The average distribution of the cost of raising potatoes is shown in table 19:

TABLE 19. AVERAGE DISTRIBUTION OF COST OF PRODUCING POTATOES

	1912		1913	
	Average cost per acre	Per cent of total cost	Average cost per acre	Per cent of total cost
Seed	$15.10	23	$ 7.67	14
Fertilizer	6.73	10	5.17	9
Manure	....	....	6.14	11
Man labor	17.26	27	14.93	26
Horse labor	14.19	22	11.66	21
Equipment labor	3.96	6	3.88	7
Use of land	4.74	7	4.53	8
Use of buildings	0.50	1	1.27	2
Sprays	1.70	3	0.83	1
Miscellaneous	0.70	1	0.63	1
Total cost	$64.88		$56.71	

Fluctuation in the value of seed constitutes a large part of the yearly fluctuation in the cost per acre of raising potatoes. Seed potatoes were much higher in 1912 than in 1913. The average amount of seed used per acre was 10.01 bushels in 1913.

One farmer used about 2000 pounds of commercial fertilizer per acre. No other farmer used more than 635 pounds per acre.

In 1912 two farmers, and in 1913 five farmers, did not spray potatoes. The highest cost of spray materials per acre was $3.75.

On six farms in 1912 and on three in 1913 no potatoes were stored and consequently there was no charge for use of buildings on these farms. One farmer had a charge of $3.33 per acre for use of buildings.

In 1913 the cost of producing potatoes was separated from the cost of marketing. Many potatoes were not marketed until after the accounts were closed. For this reason, the costs of marketing are for a smaller number of total bushels than were produced. The data concerning the cost of marketing potatoes in 1913 are given in table 20:

TABLE 20. COST OF MARKETING POTATOES, 1913

Number of farms	11
Number of bushels of potatoes	4,551
Man hours per bushel	0.43
Horse hours per bushel	0.29
Average haul in miles (round trip)	6.3
Man labor cost per bushel	$0.07
Horse labor cost per bushel	0.04
Equipment labor cost per bushel	0.01
Total cost per bushel	$0.12

OTHER CROPS

Tabulations were made for several other crops in 1913. The number of farms used in each tabulation is small, and weather conditions that year were exceptionally poor for the production of some crops. For these reasons only a few factors are given. These are presented in table 21.

Alfalfa.— On three farms alfalfa was produced in fields of 2 acres or more. On one of these there were 7.5 acres in alfalfa, on another 28 acres, and on the third 67 acres. These farms were located on limestone soil in the central part of the State, in regions where alfalfa does exceptionally well. The average yield per acre on these farms was 3.34 tons; the average yield for New York State was 2.33 tons in 1899 and 2.46 tons in 1909.[8] The number of man hours and of horse hours per acre seem to be about normal. The amount charged for use of land indicates the high value of the land on which alfalfa is produced. These factors may be typical for alfalfa grown on the better farms in the best alfalfa sections of New York State in favorable years.

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[8] Warren, G. F. Crop yields and prices, and our future food supply. Cornell Univ. Agr. Exp. Sta. Bul. 341 : 191.

TABLE 21. AVERAGES FOR SEVERAL CROPS FOR WHICH A SMALL NUMBER OF ACCOUNTS WERE KEPT, 1913

	Alfalfa	Barley	Beans	Buckwheat	Cabbage	Wheat
Number of farms.....	3	3	2	7	4	5
Number of acres.....	102.5	43	83	75.6	28.6	38
Yield per acre........	3.34 tons	31.9 bu.	9 bu.	14 bu.	5.2 tons	27.4 bu.
Value per acre.......	$53.37	$24.88	$27.28	$12.21	$105.77	$29.98
Cost per acre........	20.02	26.97	24.58	18.52	45.64	29.17
Profit or loss per acre.	33.35	— 2.09	2.70	— 6.31	60.13	0.81
Man hours per acre...	28.56	34.74	31.73	20.35	90.92	23.67
Horse hours per acre..	23.95	50.46	44.60	37.46	73.43	41.47
Cost of use of land per acre..............	$7.39	$4.99	$4.33	$2.53	$5.20	$3.95

Barley.— Barley was produced on three farms. The average yield was 31.9 bushels per acre; the average yield for New York State in 1913 was 26.7 bushels per acre.[9] The number of man hours and of horse hours, and the cost per acre, seem too high when compared with the average cost of producing oats.

Beans.— A heavy freeze on September 15, 1913, seriously injured the bean crop of New York State. The average yield of beans on the two farms for which results are given was only 9 bushels per acre. The average yield for New York State in 1909 was 14.5 bushels.[10]

Buckwheat.— Buckwheat was produced on seven farms. This crop also was seriously injured by the freeze of September 15. The average yield for these seven farms was 14 bushels per acre. The average yield per acre for the whole State was 14.3 bushels in 1913, and was 18.8 bushels per acre for the ten years from 1900 to 1909.[11]

Cabbage.— The year 1913 was unfavorable for the growth of cabbage. The average yield on the four farms tabulated was 5.2 tons per acre. This is a little more than half the normal yield. The price received per ton was more than enough to make up for the low yield, and the profit per acre was abnormally high. The man hours and the horse hours per acre, and the cost per acre, were probably lower than the normal because of the small tonnage harvested.

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[9] U. S. Agr. Dept. Yearbook **1913**: 397.
[10] Thirteenth Census of the United States **7**: 210. 1910.
[11] U. S. Agr. Dept. Yearbook **1913**: 407.

Wheat.— The wheat tabulation included five farms with 38 acres. The average yield was 27.4 bushels per acre; the average yield for the State was 20 bushels per acre for 1913, and was 17.4 bushels for the ten years from 1900 to 1909.[12] The number of man hours and of horse hours per acre, and the cost per acre, were probably too high to be typical.

DAIRY COWS

Dairy cows are the most important livestock kept on New York farms. Seven farms in 1912, and twenty-two farms in 1913, had herds of five or more cows and were used in the tabulations. The herds on one of these farms in 1912 and on five in 1913 were purebreds. All these cattle were of the Holstein-Friesian breed, which was also the predominating breed among the grade cattle.

The principal products sold from the dairy farms were milk and stock. Milk was sold largely as market milk, to be shipped to the large cities. Small quantities of cream, butter, creamery milk, and cheese factory milk, were sold.

Most of the results were calculated on the cattle unit basis. One cow, one bull, or two head of young stock, were counted as one cattle unit. The smallest herd used in the tabulations had an average of 5.5 cows; the largest herd averaged 40.5 cows. Both these herds showed a profit. The data are given in table 22. The results of the dairy accounts for 1912 and 1913 are summarized in tables 23 and 24, respectively.

TABLE 22. DAIRY COWS

	1912		1913	
	Grades	Purebreds	Grades	Purebreds
Number of farms	6	1	17	5
Number of cows	111.0	18.5	297.5	110.5
Number of cattle units	174.2	25.0	406.33	163.75
Average number of cows per farm	18.5	18.5	17.5	22.1
Average number of cattle units per farm	29.03	25.00	23.90	32.75
Average value per cow	$72.23	$211.49	$71.10	$215.90
Average value per cattle unit	70.14	201.00	67.32	224.10

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[12] U. S. Agr. Dept. Yearbook 1913 : 382.

TABLE 23. SUMMARY OF RESULTS OF DAIRY ACCOUNTS FOR 1912

	Grade herds			Purebred herds		
	Total	Per cattle unit	Per cent of total	Total	Per cattle unit	Per cent of total
Costs						
Forage (except silage)	$2,298.85	$ 13.20	16	$ 384.45	$15.38	12
Bedding	268.50	1.54	2	53.06	2.12	2
Silage	2,509.70	14.41	18	603.00	24.12	18
Grain	3,431.89	19.70	24	1,017.13	40.68	31
Pasture	1,000.00	5.74	7	50.00	2.00	2
Veterinary fees and medicine	35.47	0.20	......	43.79	1.75	1
Man labor	2,921.37	16.77	21	645.73	25.83	20
Horse labor	425.31	2.44	3	58.85	2.35	2
Equipment labor	144.38	0.83	1	14.71	0.59	....
Use of buildings	378.00	2.17	3	80.00	3.20	2
Interest	613.67	3.52	4	251.25	10.05	8
Miscellaneous	203.63	1.17	1	70.66	2.83	2
Total cost	$14,230.77	$81.69	......	$3,272.63	$130.90	....
Returns						
Manure	$1,475.50	$ 8.47	......	$ 120.00	$ 4.80	....
Milk — per grade cow, $82.88	9,200.26	......	......	....	......	....
Milk — per purebred cow, $92.16	....	......	......	1,704.91	......	....
Cattle increase and net sales	3,598.34	20.66	......	2,487.26	99.49	....
Miscellaneous receipts	31.55	0.18	......	....	......	....
Total returns	$14,305.65	$82.12	......	$4,312.17	$172.49	....
Profit	$74.88	$0.43	......	$1,039.54	$41.59	....

The total cost of keeping a cattle unit of grade stock was $81.69 in 1912, and $92.01 in 1913; the total cost of keeping a cattle unit of purebred stock was $130.90 in 1912, and $139.90 in 1913. Grade cows produced milk to the value of $82.88 per cow in 1912, and $99.47 per cow in 1913; the value of the milk produced by purebreds was $92.16 per cow in 1912, and $107.72 per cow in 1913.

The greatest difference in returns from grade and purebred stock was in the cattle increase and net sale. This factor was found by adding together the last cattle inventory and the cattle sold, and subtracting from this total the sum of the first cattle inventory and the cattle purchased. Cattle increase and net sales for grade stock amounted to $20.66 per cattle unit in 1912, and $18.02 per cattle unit in 1913; for purebred stock this item was $99.49 per cattle unit in 1912, and $87.06 per cattle unit in 1913.

TABLE 24. SUMMARY OF RESULTS OF DAIRY ACCOUNTS FOR 1913

	Grade herds			Purebred herds		
	Total	Per cattle unit	Per cent of total	Total	Per cattle unit	Per cent of total
Costs						
Forage (except silage)	$7,112.04	$17.50	19	$3,766.51	$23.00	16
Bedding	902.95	2.22	3	418.46	2.56	2
Silage	5,329.70	13.12	14	2,347.10	14.33	10
Grain	9,229.94	22.71	25	5,597.74	34.18	25
Pasture	2,014.49	4.96	5	740.65	4.52	3
Veterinary fees and medicine	82.69	0.20	......	90.75	0.55	....
Man labor	7,827.16	19.26	21	4,563.23	27.87	20
Horse labor	1,071.08	2.64	3	526.47	3.22	2
Equipment labor	370.28	0.91	1	158.57	0.97	1
Use of buildings	1,143.17	2.81	3	384.00	2.35	2
Interest	1,442.10	3.55	4	1,836.58	11.22	8
Miscellaneous	866.07	2.13	2	2,478.09	15.13	11
Total cost	$37,391.67	$92.01	......	$22,908.15	$139.90	....
Returns						
Manure	$4,306.50	$10.60	......	$1,655.00	$10.11	....
Milk — per grade cow, $99.47	29,591.32	......	......	....	......	....
Milk — per purebred cow, $107.72	....	......	......	11,902.51	......	....
Cattle increase and net sales	7,323.96	18.02	......	14,256.67	87.06	....
Miscellaneous receipts	159.77	0.39	......	293.03	1.79	....
Total returns	$41,381.55	$101.84	......	$28,107.21	$171.65	....
Profit	$3,989.88	$9.83	......	$5,199.06	$31.75	....

The total returns per cattle unit for grade stock were $82.12 in 1912, and $101.84 in 1913; for purebreds this figure amounted to $172.49 in 1912, and $171.65 in 1913. The profit per cattle unit on grade cattle was 43 cents in 1912, and $9.83 in 1913; on purebreds it was $41.59 in 1912, and $31.75 in 1913.

The total food and bedding cost per cattle unit for grade stock was $54.59 in 1912, and $60.51 in 1913; for purebreds it was $84.30 in 1912, and $78.59 in 1913. In 1913 this item constituted 66 per cent of the total cost of keeping grade cattle, and 56 per cent of the cost of keeping purebred cattle.

The man labor charge was much higher for purebreds than for grade stock. The charges for veterinary service and medicine, and for interest, were also higher for purebred than for grade cattle.

The average quantities of feed given the herds, the amount of labor required for their care, and the amount of milk produced, are given in table 25:

TABLE 25. Average Amounts of Feed Used, Labor Required, and Milk Produced, for Dairy Cows

	1912		1913	
	Grade cows	Purebreds	Grade cows	Purebreds
Pounds of straw for feed and bedding per cattle unit	617	160	779	798
Pounds of silage per cattle unit	*6,152	10,320	6,737	6,791
Pounds of other forage per cattle unit	*1,865	2,800	3,190	3,216
Pounds of grain per cattle unit	1,313	2,660	1,551	2,339
Man hours per cattle unit	117	130	116	161
Horse hours per cattle unit	13	19	19	23
Pounds of milk per cow	....	....	†7,926	‡8,222

* One farm did not feed silage and was omitted from this average.
† Average for 13 out of 17 herds.
‡ Average for 2 out of 5 herds.

It is shown in table 25 that purebred cattle were fed more than grade cattle, and more man hours and more horse hours were required to care for a cattle unit of purebreds than for a cattle unit of grade stock. Purebreds gave more milk per cow than did grade stock.

It should be observed that the grade cows on the cooperating farms were much better than the average New York State cow. The grade herds in the 1913 tabulation produced an average of 7926 pounds of milk per cow, whereas the average production per cow for the State was 4463 pounds in 1909.[13]

DISTRIBUTION OF LABOR

BY ENTERPRISES

All labor was first classified under labor fixed as to season, and labor not fixed as to season. Plowing, hauling fertilizer, threshing, and cleaning seed, were considered as labor not fixed as to season. Fitting the ground, planting, harvesting, cultivating, spraying, and rolling, were considered as labor fixed as to season. Marketing was not included in any of the tables. Work on cows was all considered as fixed labor. This was separated into labor on chores or other work, and milk hauling.

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[13] Thirteenth Census of the United States 7 : 205. 1910.

All labor was classified also by ten-days periods, each month being divided into three periods. From the 1st day of the month to the 10th, inclusive, was called the first period; from the 11th to the 20th day, inclusive, was called the second period; from the 21st to the last day of the month, inclusive, was called the third period.

Probably a greater proportion of fall plowing was done than is indicated by the tables. The year 1913 was the first year for which accounts were kept on several of the farms. Data from some farms could not be used in these tabulations, because fall plowing had been done, of which there was no record.

Only those farms were used in the tabulations that had a growing season typical of central New York. Farms from the extreme north or south of the State were not used. The data for man labor are contained in tables 26 to 31, inclusive, and the data for horse labor in tables 32 to 36, inclusive.

TABLE 26. DISTRIBUTION OF MAN LABOR PER ACRE ON TIMOTHY AND CLOVER BY OPERATIONS AND BY TEN-DAYS PERIODS. FIFTEEN FARMS, 662.9 ACRES, 1913

Month	Period	Hours of labor fixed as to season*	Hours of labor not fixed as to season*	Total number of hours
January	1	....	.01	.01
	2	....	....	....
	3	....	....	....
February	1	....	....	....
	2	....	....	....
	3	....	....	....
March	1	....	....	....
	2	....	.01	.01
	3	....	....	....
April	1	....	.05	.05
	2	....	.09	.09
	3	....	.02	.02
May	1	....	.01	.01
	2	....	....	....
	3	....	.01	.01
June	1	....	.02	.02
	2	....	.02	.02
	3	.13	....	.13
July	1	1.72	....	1.72
	2	3.78	....	3.78
	3	3.01	....	3.01
August	1	.84	....	.84
	2	....	....	....
	3	....	....	....
September	1	....	....	....
	2	....	.01	.01
	3	....	....	....
October	1	....	....	....
	2	....	.02	.02
	3	....	.01	.01
Total		9.48	.28	9.76

* The fixed labor was all harvesting. The labor not fixed was seeding, rolling, and other miscellaneous operations.

TABLE 27. DISTRIBUTION OF MAN LABOR PER ACRE ON OATS BY OPERATIONS AND BY TEN-DAYS PERIODS. TEN FARMS, 209.4 ACRES, 1913

Month	Period	Hours											
		Plowing	Fitting	Planting	Harvesting	Threshing	Cleaning seed	Rolling	Hauling fertilizer, etc.	Hauling seed	Total fixed as to season	Total not fixed as to season	Total
January	1	....	....	....	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	.03	....	....	....	....	.03	.03
	3	....	....	....	....	....	.02	....	....	....	....	.02	.02
February	1	....	....	....	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	....	....	....	....	....
	3	....	....	....	....	....	....	....	....	....	....	....	....
March	1	....	....	....	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	....	....	....	....	....
	3	.18	....	....	....	....	.02	....	....	....	....	.20	.20
April	1	.79	.02	....	....	....	....	....	.02	....	.02	.81	.83
	2	1.76	.41	.07	....	....	.07	....	....	....	.48	1.83	2.31
	3	1.62	1.03	.35	....	....	.21	.04	....	.01	1.42	1.84	3.26
May	1	.69	1.93	.88	....	....	.01	.30	.09	.01	3.11	.80	3.91
	2	.10	.16	.09	....	....	....	.05	....	....	.30	.10	.40
	3	....	.04	.06	....	....	....	.02	....	....	.12	....	.12
June	1	....	....	....	....	....	....	.02	....	....	.02	....	.02
	2	....	....	....	....	....	....	....	....	....	....	....	....
	3	....	....	....	....	....	....	....	....	....	....	....	....
July	1	....	....	....	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	....	....	....	....	....
	3	....	....	....	.16	.01	....	....	....	....	.16	.01	.17
August	1	....	....	....	2.83	.07	....	....	....	....	2.83	.07	2.90
	2	....	....	....	3.68	.25	....	....	....	....	3.68	.25	3.93
	3	....	....	....	.60	.60	....	....	....	....	.60	.60	1.20
September	1	....	....	....	....	1.00	....	....	....	....	....	1.00	1.00
	2	....	....	....	....	....	....	....	.07	....	....	.07	.07
	3	....	....	....	....	.01	....	....	....	....	....	.01	.01
October	1	....	....	....	....	.78	....	....	....	....	....	.78	.78
	2	....	....	....	....	.06	....	....	....	....	....	.06	.06
	3	....	....	....	....	.55	....	....	....	....	....	.55	.55

November........	1	....	....	....	....	.09	....	....	....	....	....	.09	.09
	2	.45	....	....	....	....	....	....	....	....	....	.45	.45
	3	.10	....	....	....	....	....	....	....	....	....	.10	.10
December........	1	....	....	....	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	.07	....	....	.07	.07
	3	....	....	....	....	....	....	....	....	....	....	....	....
Total........	..	5.69	3.59	1.45	7.27	3.42	.36	.43	.25	.02	12.74	9.74	22.48

TABLE 28. DISTRIBUTION OF MAN LABOR PER ACRE ON SILAGE CORN BY OPERATIONS AND BY TEN-DAYS PERIODS. SEVEN FARMS, 70.1 ACRES, 1913

Month	Period	Hours								
		Plowing	Fitting	Planting	Cultivating	Harvesting	Hauling fertilizer, etc.	Total fixed as to season	Total not fixed as to season	Total
March	1	....	....	....	....	....	....	....	....	....
	2	.07	....	....	....	....	....	....	.07	.07
	3	.32	....	....	....	....	....	....	.32	.32
April	1	.41	....	....	....	....	....	....	.41	.41
	2	....	.02	....	....	....	.02	.02	.02	.04
	3	.14	....	....	....	....	....	....	.14	.14
May	1	1.69	.10	....	....	....	....	.10	1.69	1.79
	2	.81	1.05	.17	....	....	....	1.22	.81	2.03
	3	2.00	1.55	.40	....	....	.02	1.95	2.02	3.97
June	1	.12	1.05	.59	....	....	.04	1.64	.16	1.80
	2	.19	.42	.37	2.23	....	....	3.02	.19	3.21
	3	....	.04	....	1.89	....	....	1.93	....	1.93
July	1	....	....	....	1.75	....	....	1.75	....	1.75
	2	....	....	....	1.46	....	....	1.46	....	1.46
	3	....	....	....	1.99	....	....	1.99	....	1.99
August	1	....	....	....	.23	....	....	.23	....	.23
	2	....	....	....	.58	....	....	.58	....	.58
	3	....	....	....	....	....	....	....	....	....
September	1	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	1.48	....	1.48	....	1.48
	3	....	....	....	....	9.99	....	9.99	....	9.99

October..........	1	....	....	....	....	3.09	....	3.09	....	3.09
	2	....	....	....	....	.29	....	.29	....	.29
	3	....	....	....	....	....	....	....	....	....
November.......	1	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	....	....
	3	.61	....	....	....	....	....	....	.61	.61
Total......	......	6.36	4.23	1.53	10.13	14.85	.08	30.74	6.44	37.18

TABLE 29. DISTRIBUTION OF MAN LABOR PER ACRE ON POTATOES BY OPERATIONS AND BY TEN-DAYS PERIODS. SIX FARMS, 108.5 ACRES, 1913

Month	Period	Hours										
		Plowing	Fitting	Planting	Cultivating	Harvesting	Hauling fertilizer, etc.	Drilling fertilizer	Spraying	Total fixed as to season	Total not fixed as to season	Total
February	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	.16	......	......	......	.16	.16
March	1	......	......	......	......	......	.05	......	......	......	.05	.05
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
April	1	.60	......	......	......	......	......	......	......	......	.60	.60
	2	.42	.06	......	......	......	......	......	......	.06	.42	.48
	3	1.24	.08	.05	......	......	......	......	......	.13	1.24	1.37
May	1	.30	.65	.24	......	......	.12	......	......	.89	.42	1.31
	2	2.07	1.35	1.85	......	......	.09	.24	......	3.44	2.16	5.60
	3	.87	.32	1.92	......	......	......	.09	......	2.33	.87	3.20
June	1	.24	1.76	4.24	......	......	......	.23	......	6.23	.24	6.47
	2	.17	.76	3.54	1.26	......	......	......	......	5.56	.17	5.73
	3	.07	.35	.45	2.04	......	......	......	......	2.84	.07	2.91
July	1	.37	.06	......	1.65	......	......	.03	.32	2.06	.37	2.43
	2	.06	.06	......	1.98	......	......	......	.15	2.19	.06	2.25
	3	......	.05	.08	2.59	......	......	......	.18	2.90	......	2.90
August	1	......	......	......	2.74	......	......	......	.53	3.27	......	3.27
	2	......	......	......	.87	......	......	......	......	.87	......	.87
	3	......	......	......	.32	......	......	......	......	.32	......	.32

September........	1	......	......	......	.35	......	......	......	......	.35	......	.35
	2	......	......	......	.04	......	......	......	......	.04	......	.04
	3	......	......	......	......	.97	......	......	......	.97	......	.97
October..........	1	......	......	......	......	4.94	......	......	......	4.94	......	4.94
	2	......	......	......	......	6.03	......	......	......	6.03	......	6.03
	3	......	......	......	......	7.69	......	......	......	7.69	......	7.69
November........	1	......	......	......	......	6.13	......	......	......	6.13	......	6.13
	2	......	......	......	......	1.70	......	......	......	1.70	......	1.70
	3	......	......	......	......	......	......	......	......	......	......	......
Total........	......	6.41	5.50	12.37	13.84	27.46	.42	.59	1.18	60.94	6.83	67.77

TABLE 30. DISTRIBUTION OF MAN LABOR PER ACRE ON BUCKWHEAT BY OPERATIONS AND BY TEN-DAYS PERIODS. FIVE FARMS, 66.6 ACRES, 1913

Month	Period	Hours										
		Plowing	Fitting	Planting	Harvesting	Threshing	Rolling	Hauling fertilizer, etc.	Hauling seed	Total fixed as to season	Total not fixed as to season	Total
May	1	.78	......	......	......	......	......	......	......	......	.78	.78
	2	.51	.47	......	......	......	......	......	......	.47	.51	.98
	3	.90	.23	.20	......	......	......	......	......	.43	.90	1.33
June	1	.35	......	......	......	......	......	.14	......	......	.49	.49
	2	2.15	.45	.18	......	......	.04	......	......	.67	2.15	2.82
	3	1.10	.55	.18	......	......	......	......	.56	.73	1.66	2.39
July	1	......	1.05	1.16	......	......	.29	......	......	2.50	......	2.50
	2	......	......	.04	......	......	......	......	......	.04	......	.04
	3	......	......	......	......	......	......	......	......	......	......	....
August	1	......	......	......	......	......	......	......	......	......	......	....
	2	......	......	......	......	......	......	......	......	......	......	....
	3	......	......	......	......	......	......	......	......	......	......	....
September	1	......	......	......	.65	......	......	......	......	.65	......	.65
	2	......	......	......	1.40	......	......	......	......	1.40	......	1.40
	3	......	......	......	.87	......	......	......	......	.87	......	.87
October	1	......	......	......	.63	1.39	......	......	......	.63	1.39	2.02
	2	......	......	......	......	.03	......	......	......	......	.03	.03
	3	......	......	......	......	......	......	......	......	......	......	....

November........	1	......	......	......	......	.15	......	......	......	......	.15	.15
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
Total.........	......	5.79	2.75	1.76	3.55	1.57	.33	.14	.56	8.39	8.06	16.45

TABLE 31. DISTRIBUTION OF MAN LABOR PER CATTLE UNIT ON GRADE COWS BY OPERATIONS AND BY TEN-DAYS PERIODS. FIVE FARMS, 173.25 CATTLE UNITS, 1913

Month	Period	Hours	
		Chores and other work	Hauling milk
January	1	4.17	.36
	2	3.95	.34
	3	4.16	.40
February	1	3.77	.38
	2	4.11	.34
	3	3.73	.22
March	1	4.35	.42
	2	4.17	.28
	3	4.90	.36
April	1	4.23	.40
	2	3.88	.37
	3	3.68	.34
May	1	3.26	.36
	2	3.08	.39
	3	3.15	.39
June	1	2.77	.31
	2	2.52	.34
	3	2.55	.30
July	1	2.65	.32
	2	2.57	.35
	3	2.65	.44
August	1	2.14	.33
	2	2.03	.33
	3	2.47	.38
September	1	2.24	.38
	2	2.25	.35
	3	2.26	.32
October	1	2.27	.34
	2	2.76	.37
	3	3.12	.35
November	1	3.09	.32
	2	3.15	.35
	3	3.34	.33
December	1	3.55	.34
	2	3.72	.32
	3	4.17	.40
Total	......	116.86	12.62

TABLE 32. DISTRIBUTION OF HORSE LABOR PER ACRE ON TIMOTHY AND CLOVER BY OPERATIONS AND BY TEN-DAYS PERIODS. FIFTEEN FARMS, 662.9 ACRES, 1913

Month	Period	Hours of labor fixed as to season*	Hours of labor not fixed as to season	Total number of hours
March	1	....	....	....
	2	....	....	....
	3	....	.01	.01
April	1	....	.03	.03
	2	....	.17	.17
	3	....	.04	.04
May	1	....	.02	.02
	2	....	....	....
	3	....	.02	.02
June	1	....	.02	.02
	2	....	.02	.02
	3	.18	....	.18
July	1	1.73	....	1.73
	2	3.58	....	3.58
	3	3.03	....	3.03
August	1	.62	....	.62
	2	....	....	....
	3	....	....	....
September	1	....	....	....
	2	....	.01	.01
	3	....	....	....
October	1	....	....	....
	2	....	....	....
	3	....	.01	.01
Total	......	9.14	.35	9.49

*The fixed labor was all harvesting. The labor not fixed was seeding, rolling, and other miscellaneous operations.

TABLE 33. DISTRIBUTION OF HORSE LABOR PER ACRE ON OATS BY OPERATIONS AND BY TEN-DAYS PERIODS. TEN FARMS, 209.4 ACRES, 1913

Month	Period	Hours										
		Plowing	Fitting	Planting	Harvesting	Threshing	Cleaning seed	Rolling	Hauling fertilizer	Total fixed as to season	Total not fixed as to season	Total
March	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	......	......	......	......
	3	.38	......	......	......	......	......	......	......	......	.38	.38
April	1	1.65	.02	......	......	......	......	......	.07	.02	1.72	1.74
	2	3.68	1.02	.07	......	......	......	......	......	1.09	3.68	4.77
	3	3.38	2.65	.53	......	......	.01	.08	......	3.26	3.39	6.65
May	1	1.66	4.27	1.69	......	......	......	.60	.06	6.56	1.72	8.28
	2	.20	.53	.19	......	......	......	.10	......	.82	.20	1.02
	3	......	.12	.11	......	......	......	.04	......	.27	......	.27
June	1	......	......	......	......	......	......	.05	......	.05	......	.05
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
July	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	.19	.02	......	......	......	.19	.02	.21
August	1	......	......	......	2.75	......	......	......	......	2.75	......	2.75
	2	......	......	......	3.41	.04	......	......	......	3.41	.04	3.45
	3	......	......	......	.52	.03	......	......	......	.52	.03	.55
September	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	.02	......	.02	.02
	3	......	......	......	......	......	......	......	......	......	......	......

October	1	......	......	......	......	.08	......	......	......	......	.08	.08
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	.04	......	......	......	......	.04	.04
November	1	......	......	......	......	......	......	......	......	......	......	......
	2	.86	......	......	......	......	......	......	......	......	.86	.86
	3	.20	......	......	......	......	......	......	......	......	.20	.20
December	1	......	......	......	......	......	......	......	.07	......	.07	.07
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
Total	......	12.01	8.61	2.59	6.87	.21	.01	.87	.22	18.94	12.45	31.39

TABLE 34. DISTRIBUTION OF HORSE LABOR PER ACRE ON SILAGE CORN BY OPERATIONS AND BY TEN-DAYS PERIODS. SEVEN FARMS, 70.1 ACRES, 1913

Month	Period	Hours								
		Plowing	Fitting	Planting	Culti-vating	Harvesting	Hauling fertilizer	Total fixed as to season	Total not fixed as to season	Total
March	1	....	....	....	....	....	....	....	....	....
	2	.11	....	....	....	....	....	....	.11	.11
	3	1.13	....	....	....	....	....	....	1.13	1.13
April	1	1.16	....	....	....	....	....	....	1.16	1.16
	2	....	.06	....	....	....	.05	.06	.05	.11
	3	.43	....	....	....	....	....	....	.43	.43
May	1	3.43	.19	....	....	....	....	.19	3.43	3.62
	2	2.44	2.62	.23	....	....	....	2.85	2.44	5 29
	3	5.80	4.69	.71	....	....	.04	5.40	5.84	11.24
June	1	.34	3.12	1.23	....	....	.11	4.35	.45	4.80
	2	.57	1.18	.34	3.43	....	....	4.95	.57	5.52
	3	....	.13	....	2.87	....	....	3.00	....	3.00
July	1	....	....	....	2.69	....	....	2.69	....	2.69
	2	....	....	....	2.18	....	....	2.18	....	2.18
	3	....	....	....	3.10	....	....	3.10	....	3.10
August	1	....	....	....	.23	....	....	.23	....	.23
	2	....	....	....	.61	....	....	.61	....	.61
	3	....	....	....	....	....	....	....	....	....
September	1	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	2.11	....	2.11	....	2.11
	3	....	....	....	....	10.75	....	10.75	....	10.75

October..........	1	....	....	....	....	2.52	....	2.52	....	2.52
	2	....	....	....	....	.29	....	.29	....	.29
	3	....	....	....	....	....	....	....	....	....
November.......	1	....	....	....	....	....	....	....	....	....
	2	....	....	....	....	....	....	....	....	....
	3	1.51	....	....	....	....	....	....	1.51	1.51
Total........	......	16.92	11.99	2.51	15.11	15.67	.20	45.28	17.12	62.40

TABLE 35. DISTRIBUTION OF HORSE LABOR PER ACRE ON POTATOES BY OPERATIONS AND BY TEN-DAYS PERIODS. SIX FARMS, 108.5 ACRES, 1913

Month	Period	Hours										
		Plowing	Fitting	Planting	Cultivating	Harvesting	Hauling fertilizer	Drilling fertilizer	Spraying	Total fixed as to season	Total not fixed as to season	Total
February	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	.31	......	......	......	.31	.31
March	1	......	......	......	......	......	.09	......	......	......	.09	.09
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
April	1	1.29	......	......	......	......	......	......	......	......	1.29	1.29
	2	.83	.11	......	......	......	......	......	......	.11	.83	.94
	3	2.53	.22	.09	......	......	......	......	......	.31	2.53	2.84
May	1	.67	1.40	.02	......	......	.22	......	......	1.42	.89	2.31
	2	4.88	3.26	1.49	......	......	.23	.50	......	5.25	5.11	10.36
	3	2.25	.77	1.12	......	......	......	.18	......	2.07	2.25	4.32
June	1	.55	3.86	2.57	......	......	......	.46	......	6.89	.55	7.44
	2	.47	1.70	1.89	1.31	......	......	......	......	4.90	.47	5.37
	3	.22	.79	.29	3.12	......	......	......	......	4.20	.22	4.42
July	1	.43	.13	......	2.10	......	......	.06	.28	2.57	.43	3.00
	2	.13	.17	......	2.71	......	......	......	......	2.88	.13	3.01
	3	......	.14	.07	1.90	......	......	......	.17	2.28	......	2.28
August	1	......	......	......	1.51	......	......	......	.68	2.19	......	2.19
	2	......	......	......	.24	......	......	......	......	.24	......	.24
	3	......	......	......	.33	......	......	......	......	.33	......	.33

September........	1	......	......	......	.18	......	......	......	......	.18	......	.18
	2	......	......	......	.04	......	......	......	......	.04	......	.04
	3	......	......	......	......	.74	......	......	......	.74	......	.74
October..........	1	......	......	......	......	2.27	......	......	......	2.27	......	2.27
	2	......	......	......	......	3.57	......	......	......	3.57	......	3.57
	3	......	......	......	......	4.71	......	......	......	4.71	......	4.71
November........	1	......	......	......	......	3.94	......	......	......	3.94	......	3.94
	2	......	......	......	......	1.76	......	......	......	1.76	......	1.76
	3	......	......	......	......	......	......	......	......	......	......	......
Total.........	......	14.25	12.55	7.54	13.44	16.99	.85	1.20	1.13	52.85	15.10	67.95

TABLE 36. DISTRIBUTION OF HORSE LABOR PER ACRE ON BUCKWHEAT BY OPERATIONS AND BY TEN-DAYS PERIODS. FIVE FARMS, 66.6 ACRES, 1913

Month	Period	Hours										
		Plowing	Fitting	Planting	Harvesting	Threshing	Rolling	Hauling fertilizer	Hauling seed	Total fixed as to season	Total not fixed as to season	Total
May	1	2.10	......	......	......	......	......	......	......	......	2.10	2.10
	2	1.48	1.23	......	......	......	......	......	......	1.23	1.48	2.71
	3	2.51	.54	......	......	......	......	......	......	.54	2.51	3.05
June	1	.71	......	......	......	......	......	.09	......	......	.80	.80
	2	5.91	1.10	.36	......	......	.09	......	......	1.55	5.91	7.46
	3	2.46	1.12	.15	......	......	......	......	1.17	1.27	3.63	4.90
July	1	......	2.78	1.94	......	......	.27	......	......	4.99	......	4.99
	2	......	......	.09	......	......	......	......	......	.09	......	.09
	3	......	......	......	......	......	......	......	......	......	......	......
August	1	......	......	......	......	......	......	......	......	......	......	......
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
September	1	......	......	......	.95	......	......	......	......	.95	......	.95
	2	......	......	......	2.09	......	......	......	......	2.09	......	2.09
	3	......	......	......	.74	......	......	......	......	.74	......	.74
October	1	......	......	......	.69	1.11	......	......	......	.69	1.11	1.80
	2	......	......	......	......	......	......	......	......	......	......	......
	3	......	......	......	......	......	......	......	......	......	......	......
Total	......	15.17	6.77	2.54	4.47	1.11	.36	.09	1.17	14.14	17.54	31.68

BY FARMS

The following charts (Figs. 132–134) show the distribution of man labor on three farms with different types of farming:

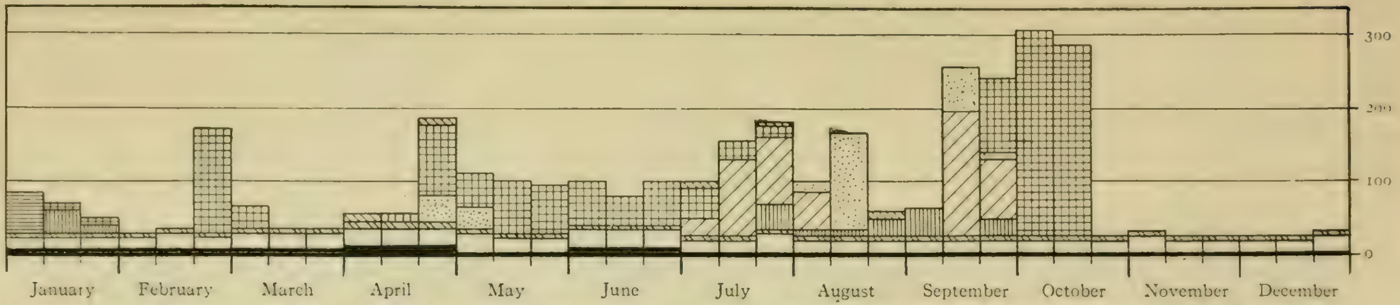

FIG. 132. DISTRIBUTION OF MAN LABOR BY OPERATIONS AND BY TEN-DAYS PERIODS ON A FARM HAVING 2 COWS AND 2.5 HORSES, AND PRODUCING 65 ACRES OF HAY, 20 ACRES OF OATS, 22 ACRES OF POTATOES, AND 2 ACRES OF WHEAT

■ Cows
□ Horses
▧ Poultry
▥ Farm
▒ Hogs
▨ Equipment
▩ Alfalfa
▥ Corn
▨ Hay
░ Oats
▦ Wheat
▧ Feed and supplies
▒ Manure
▥ Personal
▤ Outside labor
▨ Cabbage
▦ Potatoes

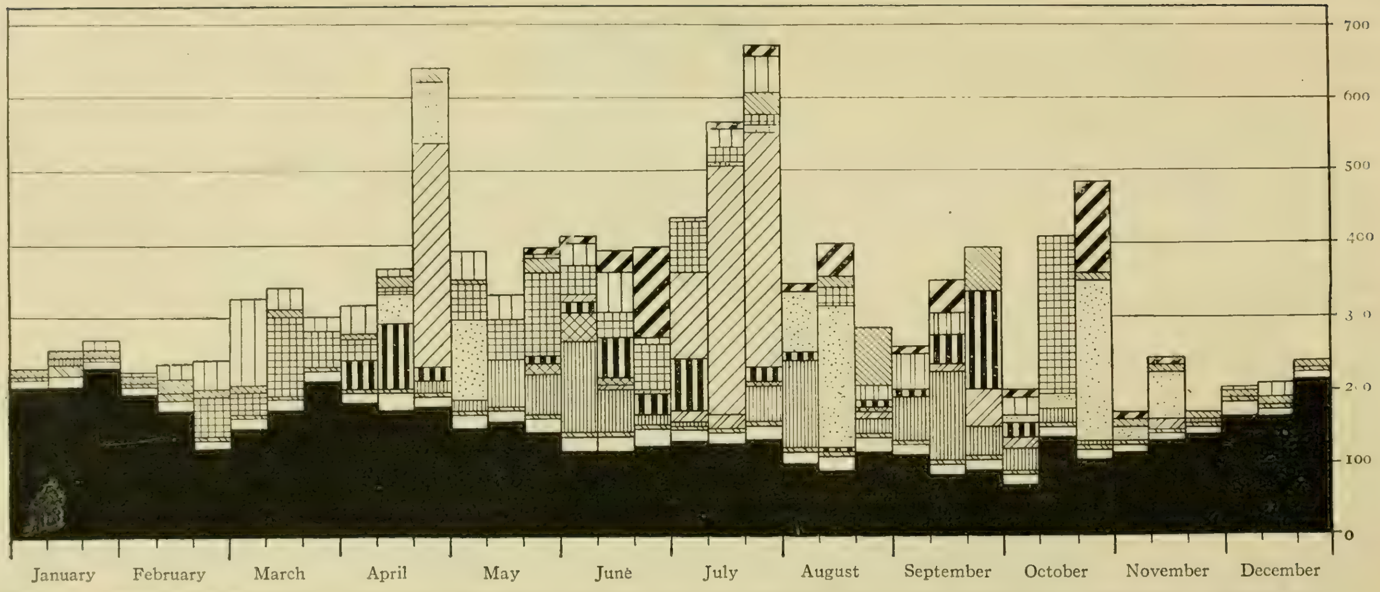

FIG. 133. DISTRIBUTION OF MAN LABOR BY OPERATIONS AND BY TEN-DAYS PERIODS ON A FARM HAVING 40.5 COWS AND 9 HORSES, AND PRODUCING 10.7 ACRES OF POTATOES, 43.8 ACRES OF OATS, 19.2 ACRES OF SILAGE CORN, 6.7 ACRES OF CABBAGE, AND 101.7 ACRES OF HAY

■	Cows	▨	Hay
☐	Horses	▨	Oats
▨	Poultry	▥	Wheat
▤	Farm	▨	Feed and supplies
▨	Hogs	▨	Manure
▨	Equipment	▥	Personal
▩	Alfalfa	▤	Outside labor
▥	Corn	▨	Cabbage
		▦	Potatoes

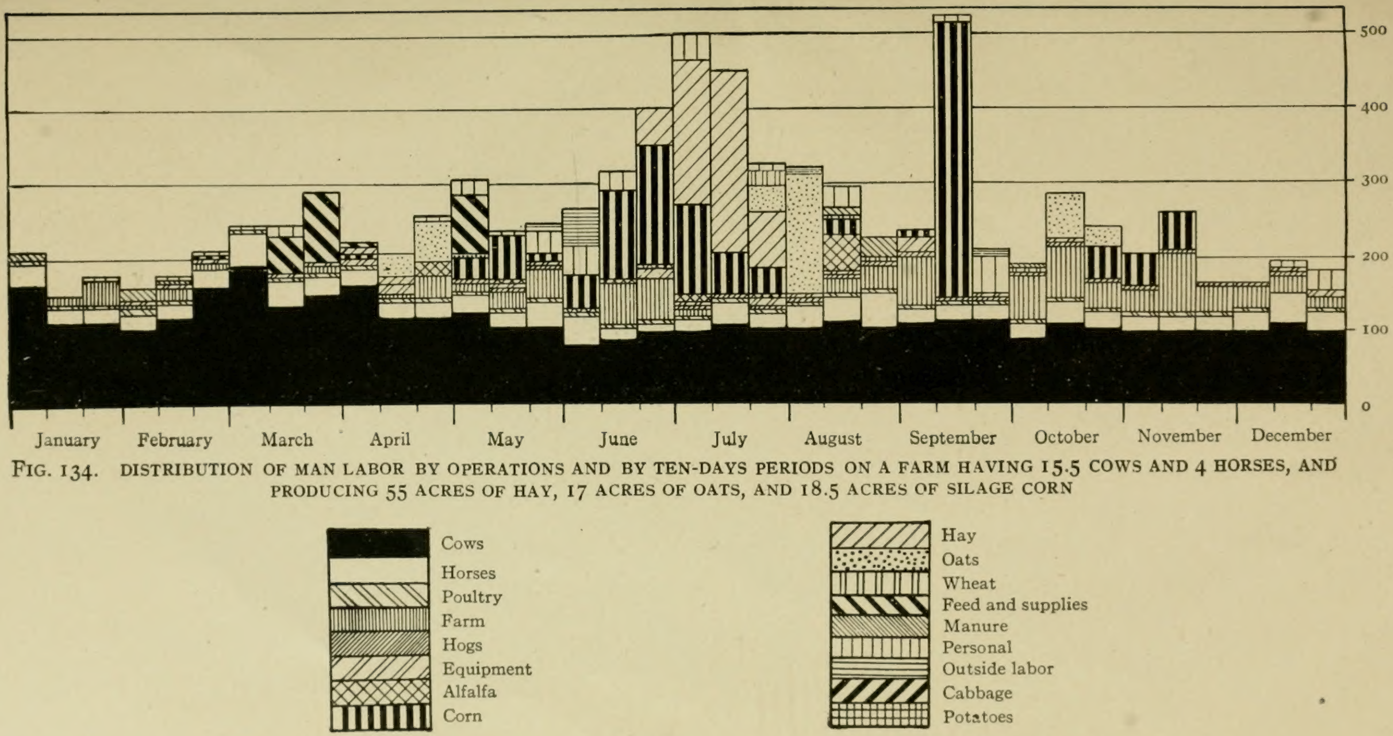

FIG. 134. DISTRIBUTION OF MAN LABOR BY OPERATIONS AND BY TEN-DAYS PERIODS ON A FARM HAVING 15.5 COWS AND 4 HORSES, AND PRODUCING 55 ACRES OF HAY, 17 ACRES OF OATS, AND 18.5 ACRES OF SILAGE CORN

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